

Submitted To: ORIGINAL

**Federal Communications Commission
Rural Health Care Pilot Program**

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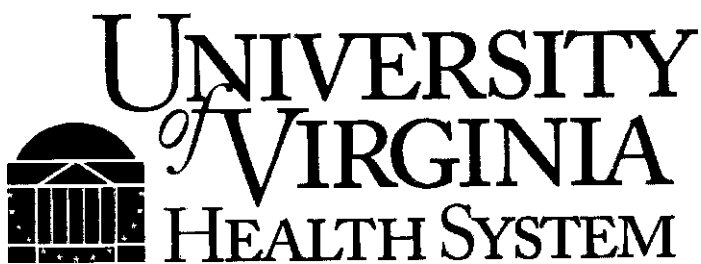
for

Virginia Acute Stroke Telehealth (VAST) Project

RE: WC Docket No. 02-60

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Transmittal Letter

OFFICE *of* TELEMEDICINE

May 2, 2007

Marlene Dortch, Secretary
Thomas Buckley
Federal Communications Commission
445 12th Street, S.W.
Washington, D. C. 20554

WC 02-60
Rural Healthcare Pilot

The Office of Telemedicine of the University of Virginia Health System submits the following proposal to the Federal Communications Commission in response to the above referenced Report and Order regarding the FCC Pilot for the Rural Healthcare Support Mechanism. This proposal promises to facilitate enhanced access to healthcare services in the Commonwealth by expanding the existing broadband infrastructure in Virginia and in particular, by building and deploying an MPLS network (Multi Protocol Label Switching), initially in the most underserved regions where limited bandwidth has been deployed. We plan to ultimately transition all the Commonwealth's health providers to this technology *so* as to deliver clinical services, educational offerings and to facilitate interoperable health information exchange. It is anticipated that all the State government entities (Virginia Department of Health, Emergency Medical Services etc) will also transition to the MPLS core.

After six months of strategic planning, it has been determined that a reduction in the disparities related to stroke, and its co-morbidities of hypertension, diabetes and heart disease is a goal very much aligned with the needs of the Commonwealth as articulated by health status indicators and the Governor's Healthy Virginians initiative. In particular, we hope to reduce the morbidity and mortality of stroke in Virginia, where currently, fewer than 2% of eligible patients receive life saving thrombolytic therapies for acute stroke. We have secured significant matching funds from agencies of the Commonwealth to implement this proposal. Our proposal partners include the Virginia Department of Health, the Virginia Telehealth Network, Virginia Polytechnic and State University, Virginia Commonwealth University, the Tobacco Commission and the Virginia Department of Housing and Community Development in addition to many healthcare facilities in the Commonwealth.

This effort will be accomplished through greater access to education and prevention programs, and via improved stroke related emergency medical services, primary care and specialty services. Through the use of advanced technologies, we propose to expedite acute stroke diagnosis, **and**, where appropriate, support the judicious administration of thrombolytic **agents** through telehealth. We propose to connect the Commonwealth's primary stroke centers, academic medical centers, community hospitals, and community health centers along with the relevant agencies of the Commonwealth.

Marlene Dortch

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We have also requested funding for emergency medical service (EMS) providers in this *acute stroke intervention network*. Although EMS providers have previously ~~been~~ considered ineligible under the current rural health care program, we hope that ~~the~~ commission will consider their statutory authority to include such a request for the pilot program, ~~as~~ EMS providers serve the public interest and are “essential to public health and public *safety*”. EMS providers ~~are often the~~ first and ~~sometimes the~~ only healthcare providers able to ~~access and~~ care for people in the most ~~rural~~ areas.

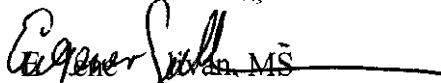
Alternatively, should the Commission determine EMS providers are not eligible even under the Pilot program, we would request consideration of all other elements of this proposal.

We hope the Commission will look favorably upon this request ~~and~~ are grateful for your consideration of this proposal.

Sincerely,



Karen S. Rheuban, MD



Eugene Sullivan, MS

Co – Principal Investigators

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Executive Summary

EXECUTIVE SUMMARY

The University of Virginia (UVA) submits the following application to the Federal Communications Commission (FCC) for the Rural Health Care Pilot Program on behalf of and in partnership with the Commonwealth of Virginia and its academic medical centers, universities, urban and rural healthcare providers, state health and information technology agencies, and health care associations. We request \$1.71 million from the FCC and offer \$1.66 million in matching funds, as strong evidence of our commitment to this project.

This opportunity serves as a catalyst for integrating technology more broadly into the Commonwealth's public and private health care sectors. We have aligned this effort with a major health disparity affecting all Virginians, but in particular our rural citizens. In 2006, fewer than 2% of eligible Virginia stroke patients received time sensitive, brain-saving, thrombolytic therapy. Therefore we propose to use telehealth applications to improve prevention, diagnosis, and treatment of stroke (including supporting the administration of thrombolytic agents) and its co-morbidities of heart disease, hypertension, diabetes and obesity, to improve the health of the citizens of the Commonwealth.

All parties involved recognize the importance of having this program under the leadership of an organization with the expertise to manage and direct such an important statewide initiative. With the support of all organizations involved, the Office of Telemedicine of the University of Virginia Health System has been chosen to be the applicant for the Rural Health Care Pilot Program. The Office of Telemedicine has more than 10 years of experience in delivering rural and urban telehealth/telemedicine services, conducting telehealth research, and in utilizing and continuously supporting (24 x 7) broadband networks to deliver remote healthcare services.

Under the leadership of the Office of Telemedicine, with this proposal, our primary objectives are to:

- Enhance and expand the broadband footprint and network infrastructure to eligible health care providers so as to support the clinical goals of our telehealth initiative
- Monitor and evaluate the network strategy and technical approach
- Report findings to the FCC

The FCC's release of the Rural Health Care Pilot Program coincides with Virginia's own efforts to deploy a network dedicated to distributed health care services and education. Over the past four years, a

collaboration of professionals representing more than 80 organizations from all regions of the Commonwealth has come together to form the Virginia Telehealth Network (VTN). The VTN has defined the clinical and technical requirements for Virginia's statewide telehealth network. These requirements form the basis for our network design.

With the announcement of the Rural Health Care Pilot Program, the VTN has partnered with the Virginia Stroke Systems Task Force, to propose a business plan to create the Virginia Acute Stroke Telehealth (VAST) Network. Stroke is the third leading cause of death in Virginia and with its co-morbidities of diabetes, obesity and hypertension; we believe this new initiative will further the goals of the Virginia Department of Health and the American Stroke Association in strengthening stroke systems of care on a statewide basis.

In implementing VAST, Virginia's broadband network underutilization will be addressed on three different levels:

1. Broadband build-out and implementation of advancing technologies,
2. Technical support for a positive end-user experience,
3. Needs-driven telehealth applications.

1. *Broadband Build-out and Implementation of Advancing Technologies*

Although there are currently several intrastate telecommunication broadband networks within Virginia, we have chosen to use this pilot opportunity to enhance and build out new broadband infrastructure and connectivity using MPLS network technologies, which the Commonwealth has selected for its state agencies

It is envisioned, that all participating healthcare providers will be migrated to a dedicated MPLS network over time. However, for the first phase implementation of VAST, our technical team has designed a very flexible "hybrid" network which rapidly enables the program's initial 48 healthcare provider sites to collectively participate in VAST, and begin utilizing the benefits of MPLS technologies via an interim solution. The different types of broadband technologies available will allow for the testing of different MPLS configurations and cost models, that once optimized, will ultimately serve as a customizable and replicable model for others to follow.

Our goal is to implement a network solution that is scaleable with future growth, and able to meet the increasing demands of healthcare providers for bandwidth, particularly to support the transmission of digital images, and high resolution video applications required for optimal acute stroke care and other clinical services.

2. *Technical Support for a Positive End User Experience*

Long-term growth in utilization is directly tied to the overall ease of use that health care providers experience as they access their telehealth applications, and the network. Many health care providers lack the resources to properly staff their facilities to support the requisite technology, which can limit utilization and overall acceptance of telehealth. We will test models of technical support and network management to better understand operational needs moving forward.

3. *Needs Driven Telehealth Applications*

A third objective is to design and implement a telecommunications network in the context of a clinical framework using the stroke continuum of care. By using stroke and its co-morbidities as our initial focus, we plan to address a major health disparity in rural and urban Virginia. Using the continuum as our roadmap, we will work alongside the Virginia Stroke Systems Task Force and healthcare providers, to continuously plan and expand telehealth services to meet clinical needs. This will help ensure end-users of the telehealth network (patients and healthcare providers) receive value for their participation.

UVA and its partners strongly believe that the statewide scale and clinical scope of this initiative calls for a highly qualified management team to ensure the cost, schedule and performance requirements of the Rural Healthcare Pilot Program are met over a one year period. Leading this effort, will be the Office of Telemedicine of the University of Virginia Health System, supported by a team of key individuals with distinguished careers in the fields of project management, telehealth, medicine and technology and will include a partnership with the Virginia Telehealth Network, which represents stakeholders throughout the Commonwealth.

Through the Federal Communications Commission's Rural Health Care Pilot Program, Virginia proposes to deploy a robust broadband telecommunications that will support the Virginia Acute Stroke Telehealth (VAST) Network. Through VAST and other applications, we anticipate a significant increase in the utilization of broadband networks for telehealth/telemedicine in Virginia. We have secured nearly dollar-for dollar--matching funds as a testament to our dedication and the level of commitment of the

Commonwealth to this important initiative. We intend to apply for additional funding in the second year of the pilot to expand the **VAST** network throughout other regions of the Commonwealth.

COMPLIANCE MATRIX

PROPOSAL CROSS REFERENCE MATRIX		
Title/ Compliance Requirement	Abbreviated Response	Proposal Response Section/ Paragraph
1) Organization that will be legally and financially responsible for the conduct of activities supported by the FCC.	Office of Telemedicine, University of Virginia Health System	Section 1
2) Goals and Objectives of the Network	To deploy the Virginia Acute Stroke Telehealth (VAST) program	Section 3
3) Estimate of the network's total costs (recurring) per year	\$1,158,000	Section 7
4) Describe how for-profit network participants will pay their fair share of the network costs	All proposed sites are non-profit	Section 3
5) Identify the source of financial support and anticipated revenues that will pay for costs not covered by the fund.	Tobacco Commission and Virginia Department of Housing and Community Development matching funds State funds for related Virginia Telehealth Network Activities	Section 7
6) List the health care facilities that will be included in the network.	48 Sites requested	Appendix A
7) Provide the address, zip code, Rural Urban Commuting Area (RUCA) code and phone number for each health care facility participating in the network.	Included	Appendix A
8) Indicate previous experience in developing and managing telemedicine programs.	Developed in 1995, the UVA Office of Telemedicine has 17 years experience in designing and managing an extensive regional telehealth program	Section 6 Appendix B

PROPOSAL CROSS REFERENCE MATRIX		
Title/ Compliance Requirement	Abbreviated Response	Proposal Response Section / Paragraph
9) Provide a project management plan outlining the project's leadership and management structure, as well as its work plan, schedule, and budget.	Leadership structure, partners, management approach, work plan and schedule included	Section 6
10) Indicate how the telemedicine program will be coordinated throughout the state or region.	UVA will work in close cooperation with the Virginia Telehealth Network and Virginia Stroke Systems Task Force	Section 5
11) Indicate to what extent the network can be self-sustaining once established.	Utilization and sustainment Strategies proposed	Section 5



1.0 INTRODUCTION

Healthcare providers in Virginia are either not connected or are poorly connected to one another – there are many reasons why this is the case – Virginia understands the business problem and has developed a strategy to drive the adoption of telehealth applications to ensure network infrastructure has value and therefore is worth having and sustaining.

Over the past several years, interested parties in the Commonwealth of Virginia, including the academic medical centers, the Virginia Department of Health, the Virginia Hospital and Healthcare Association, the Virginia Primary Care Association, the Virginia Rural Health Association and other members of the Virginia Telehealth Network have collaborated to develop technical and functional requirements for a state-wide telehealth network. Virginia has been able to leverage these prior efforts and relationships toward the development of this proposal. In fact, the proposal process has been a catalyst for jump-starting statewide telehealth planning and development, and reestablishing commitments.

There is no question that there is much work to do. Despite the availability of telehealth services in Virginia, there is not wide-spread adoption of these services by rural healthcare systems. In some cases, it is a matter of broadband availability, however, in others cases, it is a lack of demand due in part, because of the limited number and type of telehealth services offered, and/or the perception that those services are of limited value in addressing health needs.

Virginia has invested time and resources to investigate the intersections between health needs, geographic location and broadband deployment in efforts to develop a business strategy that not only provides needed network infrastructure, but also creates the content and applications that health care providers' desire.

The Rural Health Care Pilot Program has provided Virginia the opportunity to not only address broadband deployment needs, but also to focus attention on important utilization and sustainment factors - key to ensuring that the FCC's investment can be leveraged. The Office of Telemedicine is proud to offer the FCC our business plan for improving infrastructure between rural healthcare providers and healthcare resources statewide, and creating incentives for healthcare providers to get connected!



2.0 STATEMENT OF NEED

Virginia will bring the benefits of telehealth services to those rural areas of Virginia where the need is greatest—starting with a focus on Stroke Systems of Care and related co-morbidities.

Introduction

Virginia **ranks** #21 in terms of overall health status in the United States according to the United Health Foundation America's Health Rankings (2006) report. While Virginia statistics seem "average" in comparison with other states, there are areas of Virginia where the health statistics are well below the national average. These areas include 23 counties in the Appalachian region-- representing nearly one third of all counties — and counties along the South side of the state and the Eastern Shore.

Similar to other states, Virginia's leading health problems are heart disease, diabetes, hypertension, obesity and stroke. What is unique about Virginia is its location within the "Stroke Belt" region of the United States known for the highest incidence and mortality of stroke in the country. In 2004, stroke was the third leading cause of death in Virginia and represented 7% of total Virginia deaths.

Virginia is a rural state with many small towns distributed across a diverse terrain. According to Census geographic area data, Virginia is comprised of 42,769 square miles; of which 31,602 square miles (73.9%) falls into the *Census definition of rural*. Virginia residents live in 134 localities (counties and independent cities). Half of the localities had a total population less than 25,000 people, including **38** localities with a total population less than 15,000 and 19 localities with a total population less than 10,000.

The Virginia Department of Health has documented the strong correlation between an individual's health status and their geographic location — in particular the relationship between rural areas and health disparities. Given this evidence, Virginia has decided to closely examine the patterns and geographic distribution of disease — particularly stroke -- and identify gaps in current systems of stroke care, as the basis for designing solutions.

Demographics

Virginia is the twelfth most populous state. 2006 population estimates from the Weldon Cooper Center for Public Service, the official numbers used by state and local government agencies across the Commonwealth in planning and budgeting, indicate that Virginia's population has reached 7.6 million people. Some other statistics about Virginia's population include:

- 51 percent are female, and 49 percent are male.
- 11.5 percent are 65 years and older.
- 72 percent are White, 19 percent are Black, less than one percent (0.5%) percent are American Indian and Alaska Native, 5 percent are Asian, less than one percent (0.5%) are Native Hawaiian and Other Pacific Islander, 2 percent are "other" race , and 2 percent reported more than one race (multiracial).
- Across all race groups, 6 percent were Hispanic or Latino origin.

Geography and Terrain

The Commonwealth of Virginia borders six states and the District of Columbia - West Virginia, Maryland, North Carolina, Tennessee, Kentucky and West Virginia. Virginia's long east-west axis means that metropolitan northern Virginia also lies as close to New York City and New England as to its own rural western panhandle. Conversely, Lee County, at the tip of the panhandle, is closer to eight other state capitals than it is to Richmond, Virginia's own capital. Virginia is organized into five geographic regions (see Figure 1). The western portion of the state is mountainous, covered by the Allegheny and Blue Ridge mountains with the great Shenandoah Valley falling between the ranges. The central piedmont region, with its rolling hills, flattens out into the sandy coastal plain toward the Atlantic Ocean.

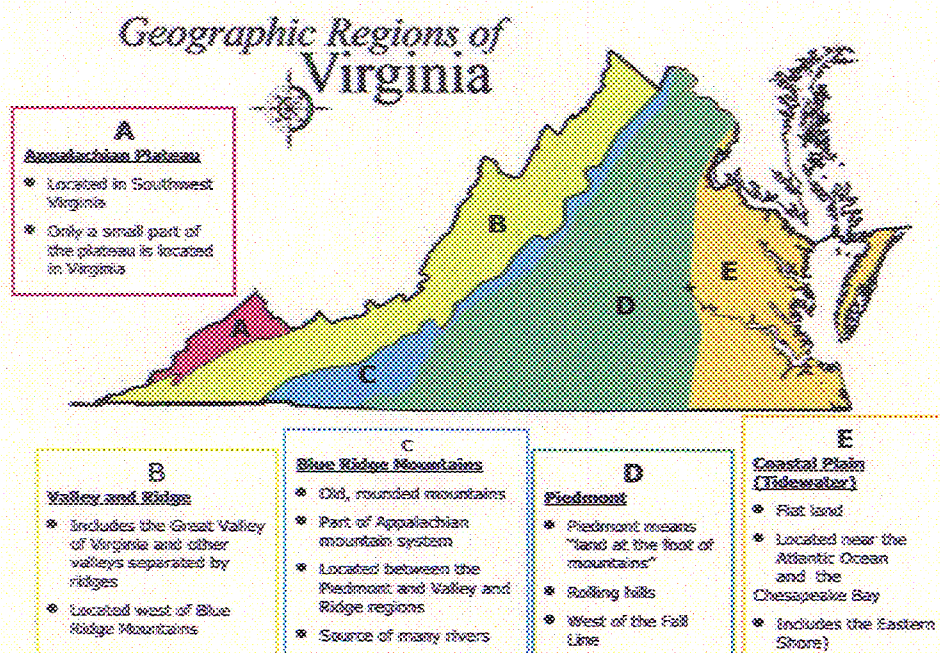


Figure 1 – Geographic Regions of Virginia

Access to Healthcare

The Census Bureau's Current Population **Survey** (CPS) data from March 2004 and 2005 estimate that 14% (or just over one million) Virginians are uninsured. Much like the U.S. as a whole, the Commonwealth's low-income population has one of the highest rates of uninsured. The proportion of families without health insurance living at or below 150% of the Federal Poverty Level (FPL) is close to or exceeds 20%. Fortunately, Virginia has a strong safety net system to deliver basic health care services for low-income, uninsured and geographically isolated individuals. Virginia's safety net providers include; 49 Free Clinics with 61 operating sites; the Virginia Primary Care Association's (VPCA) 26 member organizations operating 68 community health center service sites; 65 rural health clinics; 35 local health departments; and other providers committed to serving the underserved.

Nonetheless, 17.7% of all Virginians (over 1.3 million) live within a primary care health professional shortage area (HPSA). An HPSA is a geographic area, population group, or medical facility that has been designated by the Secretary of the Department of Health and Human Services as having a shortage of health professionals. There are HPSAs for primary health care (shortage of primary health care clinicians), dental health (shortage of dental health professionals), and mental health (shortage of mental health professionals)

Virginia has 53 primary care HPSA designations (47 geographic and 6 population group) in 66 counties and cities. There are also 49 health care facilities with HPSA designations, of which **22** are community health centers, 6 are rural health clinics and 21 are correctional centers. It is estimated that it would require an additional 105.7 FTE of primary care physicians in these institutions and areas to eliminate the primary care shortages that are currently being experienced within the Commonwealth's primary care HPSAs. The following are some key demographic statistics about Virginia's primary care HPSAs:

- Geographically, **47.3%** of the Commonwealth (18,709 square miles) is within a primary care HPSA.
- 9.3% of all Virginia urban residents and 40.3% of all Virginia rural residents live within a primary care HPSA.
- 61.6% of all Virginia's primary care HPSA residents live within a rural area.
- 31.8% of all Blacks live within a primary care HPSA.
- 30.8% of all individuals below 100% of the Federal Poverty Level (FPL), which represent 9.6% of all Virginians, live within a primary care HPSA.

- 23.2% of all elderly (over age 65) live within a primary care HPSA.

Morbidity and Mortality

According to the Virginia Center for Health Statistics, cardiovascular disease was the leading cause of death among Virginians in 2003, accounting for 19,968 deaths. This was 34.5 percent of the total deaths (57,834) in the state that year. Cardiovascular disease (CVD) is a disorder of the heart (“cardio”) and blood vessels (“vascular”). CVD includes:

- Diseases of the heart-including ischemic heart disease, such as myocardial infarction (heart attack) and other heart diseases such as heart failure.
- Essential hypertension (high blood pressure) and hypertensive renal disease.
- Cerebrovascular disease (including stroke)
- Atherosclerosis, and
- Other diseases of the circulatory system, such as aortic aneurysm

The Eastern Shore, southwest, southern and urban areas of the state (e.g., Portsmouth, Richmond City) have the highest CVD mortality rates. The northern Virginia areas tend to have the lowest mortality rates. These data tend to follow areas where other disparities lie, such as medically underserved designations or high rates of poverty.

The Commonwealth of Virginia lies in the “Stroke Belt” region of the United States. The Stroke Belt defines a region in the southeastern United States with the highest incidence and mortality of stroke in the country (1-4). In 2004, stroke was the third leading cause of death in Virginia and represented 7% of total Virginia deaths. The age-adjusted mortality rate for stroke in Virginia was 7.8 percent above the national stroke rate of 50 per 100,000 (as estimated by the National Center for Health Statistics). In particular, the African American stroke mortality rate remains one of the highest in the region and is growing through the southern states (5).

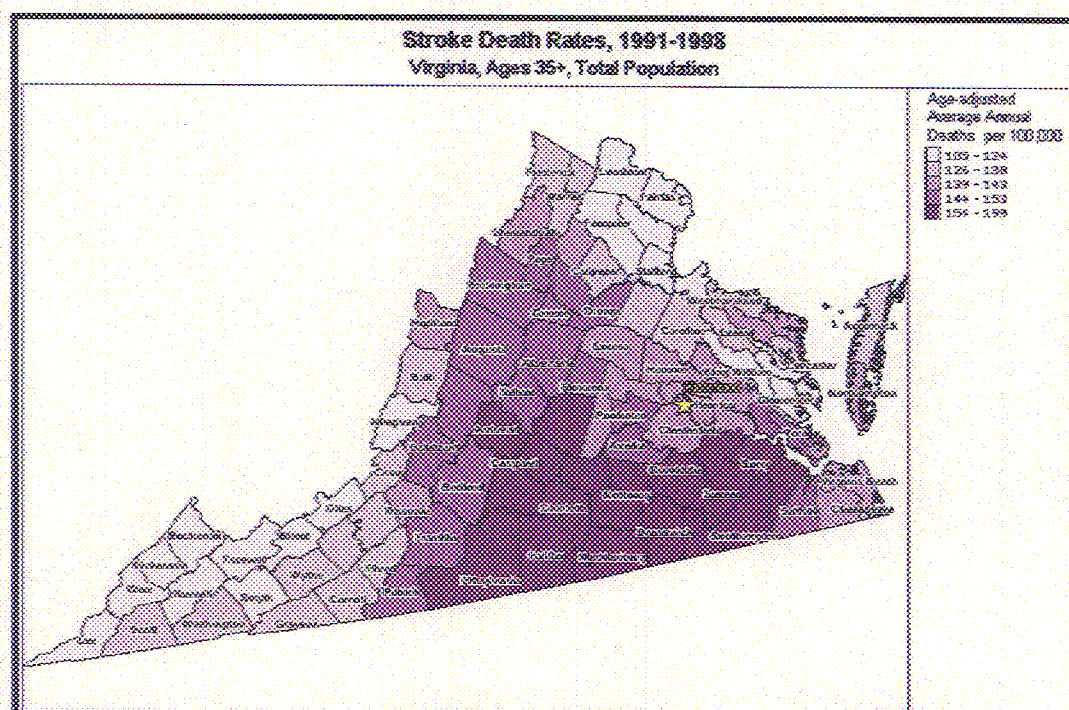


Figure 2 - Virginia Stroke Death Rates by County

There are several known risk factors and co-morbidities which can lead to stroke:

- Diabetes Mellitus
- Hypertension
- High blood cholesterol
- Overweight and obesity, physical inactivity
- Tobacco Use - in Virginia nearly 25 % of the population continues to use tobacco and use by young females is rising.

In Virginia, the counties that include the Appalachian Mountain Range (Figure 3) are known for exhibiting higher rates of heart disease and stroke mortality for all racial/ethnic, gender, and age groups.

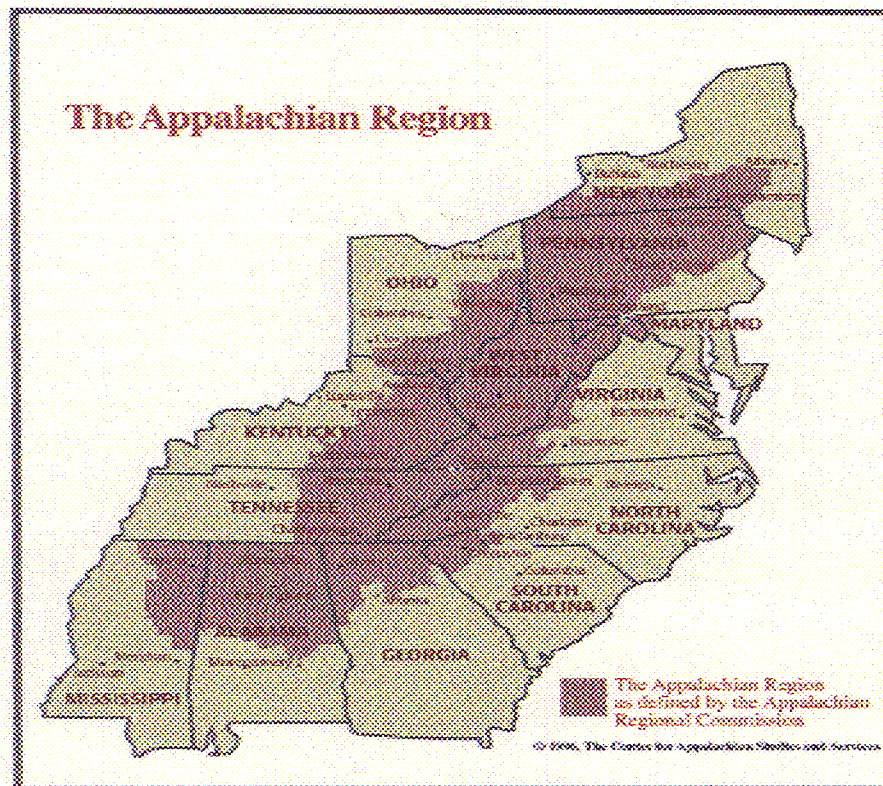


Figure 3 - Appalachian Region "Stroke Belt" (The Center for Appalachian Studies and Services)

This rural region of the Commonwealth suffers from poor health status and significant shortages of specialty healthcare providers-- including neurologists who diagnose and treat stroke patients. (See Figure 4).

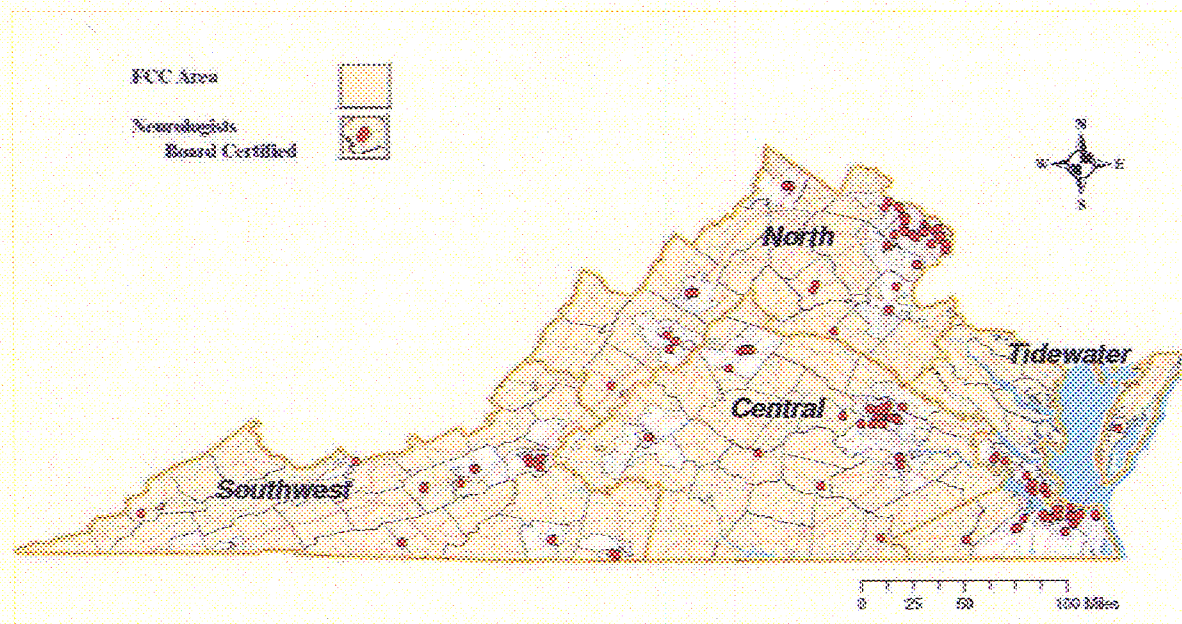


Figure 4 - Board-certified Neurologist in the State of Virginia by Regions

Representation from these regions is poor in professional societies such as the Virginia Neurological Society (1% of total members) and the American Academy of Neurology (–4% of total members). This suggests increased professional isolation with diminished resources for professional development and intellectual exchange on stroke care issues. Coupled with high rates of uninsured citizens and overall poor health status indicators, many patients fail to receive the requisite preventive health care services, patient education and interventions required to reduce the burden of stroke.

A FOCUS ON STROKE SYSTEMS OF CARE

In 2006, approximately 14,000 patients with the final diagnosis of TIA or stroke were discharged from the 85 hospitals treating stroke in the state (VDH 2004 statistics). The American Stroke Association (2006) reports a financial burden of \$58 billion from morbidity and disability from stroke. In Virginia, total charges for inpatient stroke care were over \$567 million. The additional burden of long-term disability is comparable. Given the magnitude of the stroke burden, Virginia has decided to focus on a review of stroke systems of care to identify areas where improvements can be made.

Early Recognition and Treatment

A stroke, or cerebral infarction, occurs due to a (usually abrupt) cessation of blood flow to the brain, starving the brain of oxygen and glucose. Due to its high demand for energy, the brain tissue dies within minutes. Depending on several factors—location within the brain, duration of diminished or absent blood flow, and length of time passed until treatment is rendered—a stroke can produce mild to severe disability or even death. Strokes may be ischemic (insufficient blood flow) or hemorrhagic (due to bleeding within the brain) in nature.

In 1995, the Federal Drug Administration (FDA) approved a drug called “tissue plasminogen activator” or t-PA for treatment of an acute stroke secondary to ischemia. The window of opportunity to administer this drug is very limited. Patients must receive an infusion in an emergency room, within 3 hours of the onset of the stroke. Beyond that time, this drug can actually have negative effects. Thrombolytic agents must NOT be given to patients with a hemorrhagic stroke which would worsen the central nervous systems findings, hence the necessity for accurate and timely diagnosis and therapy. This requires rapidly obtaining a brain scan (“head CT) prior to infusing the drug. Many smaller community hospitals may not have the capacity to maintain either the CT scanner or the 24/7 technical staffing needed.

If a patient, or a nearby bystander, does not recognize the signs and symptoms of stroke quickly the window of opportunity to receive t-PA closes. Therefore, it is critical that stroke be detected early, that

emergency services are notified quickly, and that patients are transported to the closest emergency room for evaluation, diagnosis and treatment. Due to Virginia's diverse topography, there are many transportation challenges for acute health needs requiring emergency medical services and rapid travel to tertiary care hospitals.

In 2004, the National Institutes of Health (NIH) established the Coverdell National Stroke Registry in four states with the mission of monitoring and improving the quality of acute stroke care. Initial results indicated large discrepancies between recommended treatment guidelines and actual emergency medical service (EMS) and hospital practices (6). Although Virginia is making strides to improve stroke systems of care, there is still evidence that stroke care is sub-optimal. Below are recent data that illustrate issues related to the delivery of state of the art acute stroke care in Virginia.

Time to Care

The Joint Commission recognizes centers that make exceptional efforts to foster better outcomes for stroke care through Primary Stroke Center (PSC) certification. Adjacency and time to a PSC is important to assure optimal care, including ability to be diagnosed rapidly and receive t-PA in the case of Acute Ischemic Stroke (AIS).

- Of the total Virginia population of 7.6 million in 2006:
 - 55% resided in zip codes within a 30 minute drive times of a PSC
 - 76% resided in zip codes within a 60 minute drive time of a PSC
 - 24% resided in zip codes more than a 120 minute drive to the nearest PSC.

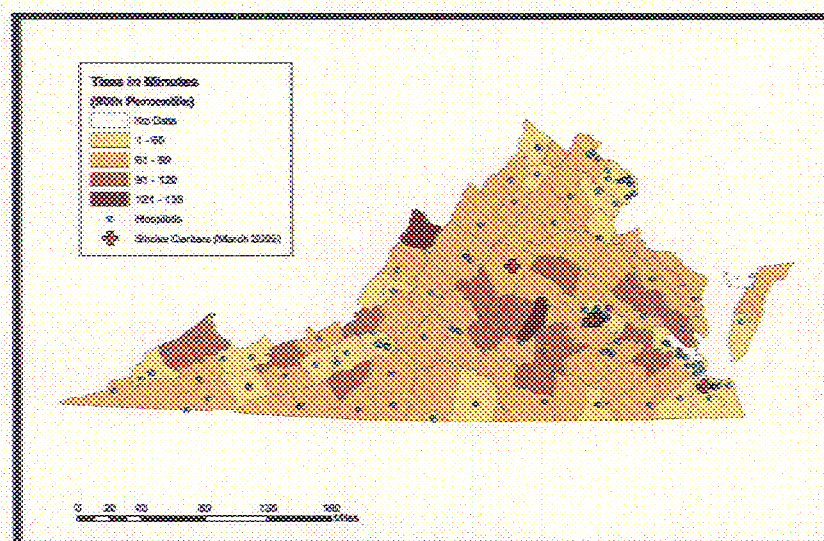


Figure 5 - EMS Call times for Potential Strokes (2003-2006)